SIEMENS

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Siemens Digital Enterprise Virtual Summit

Bringing intelligence to the shop floor with Siemens Industrial Edge

- **Siemens Industrial Edge closes the gap between local and cloud computing and enables high-frequency data exchange at field level**
- **Edge apps for intelligent data analysis and increased productivity**
- **Industrial Edge includes a backend, Edge devices and Edge apps in Edge Management**

With Siemens Industrial Edge, Siemens offers a digitalization solution that adds machine-level data processing to automation devices, by taking the intelligence of Edge computing and thus, sophisticated analytics securely to manufacturing level. Siemens Industrial Edge offers users the opportunity to execute a wide range of intelligent analytics applications. Cloud connectivity is used in conjunction with Edge applications in an integrated hardware and software ecosystem for automation components.

With Siemens Industrial Edge, Siemens offers users the opportunity to close the gap between conventional local data processing and Cloud-based data processing, depending on individual requirements. With Edge computing, large volumes of data can be processed locally almost in real time. Siemens provides users with a broad spectrum of applications for this, including data processing, data visualization via web server, data transmission to the Cloud or IT infrastructure and fast innovation cycles for app development. In addition, storage and transmission costs are reduced for users because large volumes of data are preprocessed, and only relevant data is then transmitted to a Cloud or IT infrastructure. Siemens Industrial Edge supports Cloud transmission protocols for Mindsphere, the open, cloud-based operating system from Siemens as well as Message Queuing Telemetry Transport (MQTT). This makes data transmission secure and effective.

Siemens Industrial Edge: Industrial Edge Management, Edge devices, Edge apps

Siemens Industrial Edge comprises the Industrial Edge Management System, Edge devices and Edge apps. The Industrial Edge Management System can be used to manage all connected Edge devices centrally and to monitor their condition. In addition, Edge apps are always distributed to Industrial Edge devices efficiently and securely in the latest version. Applications can be installed on Edge devices regardless of the machine operating state without adverse effects. Apps for Siemens Industrial Edge can be provided both by Siemens and by third-party providers. This means that users and machine builders also have the opportunity to develop their own applications, which are tailored to the individual requirements of their machines.

With the acquisition of US startup Pixeom, Siemens has obtained components for Edge Runtime for applications as well as for Device Management as part of the Siemens Industrial Edge ecosystem. The technology developed by Pixeom based on the Docker IT standard offers open interfaces e.g. for connection to the Mindsphere App Store, for the management of third-party hardware and for the creation of apps by Siemens customers. The Edge apps are offered via a marketplace in Mindsphere. The operating system of Siemens Industrial Edge is integrated in a universal security concept. It enables the stable operation of one or more apps in parallel and also ensures a protected software environment for the execution of applications on Edge devices.

Maximum flexibility and productivity for manufacturing plants across the entire life cycle

Industrial Edge with Simatic offers Siemens users a platform that can meet the challenges of today and tomorrow. Automation components such as Simatic controllers are additionally supported by Edge devices, enabling larger volumes of plant data to be processed profitably and providing vital information for the continuous improvement of productivity. At the same time, new applications such as condition monitoring or predictive maintenance are gaining ground in conventional automation technology. Furthermore, Edge computing offers a previously unattainable level of flexibility: plants can be kept up to date at all times via functional, feedback-free updates even for the plant life cycles expected in automation. Siemens users are supported in application development with frameworks and access to integrated connectivity with the world of automation. So far, the following Edge applications are being presented for Simatic Edge:

- Simatic Notifier

- Simatic Assistant for Machines

Stable processes and increased productivity for machine tools

For machine tools, Industrial Edge with Sinumerik provides a machine-based platform for software apps, which captures, preprocesses and analyzes high-frequency data from the machine tool. In addition, complex tool paths can be calculated, and non-productive times or work area monitoring can be optimized. With Sinumerik Edge, Siemens enables machine tool users to improve workpiece and process quality, to increase machine availability and to further optimize machine processes. The following Edge apps have been presented for Sinumerik Edge:

For workpiece quality:

- Analyze MyWorkpiece /Capture

- Analyze MyWorkpiece /Toolpath

- Analyze MyWorkpiece /Monitor

- Analyze MyWorkpiece /Vision (AI-based)

For performance optimization:

- Optimize MyMachining /Magazine (AI-based)

- Optimize MyMachining /Trochoidal

For condition monitoring and process stability:

- Protect MyMachine /3D Twin

- Analyze MyMachine /Condition

More intelligence for drive systems

Siemens is currently also piloting the connection of a Sinamics drive system to the Siemens Industrial Edge platform. This will enable high-frequency data exchange with an Edge device in drive technology in the future. The connection of Sinamics frequency converters to an Edge device enables users of machines and applications to perform complex analyses of data that is already collected in the drive. Machine-learning algorithms identify patterns and detect anomalies and their causes, thus providing timely indications of any pending maintenance. This minimizes downtimes and reduces the consumption of resources. In the field of intralogistics, for example, conclusions can be made about the current belt tension in a storage and retrieval machine. The belts, which are driven by the motor and frequency converter, require a specific tension to ensure that the application runs smoothly. If the visualization of the data analyses shows irregularities in the drive system, maintenance of the belt can be initiated in a timely manner, for example.

This background paper and a press picture are available at

https://sie.ag/3gOvqVQ

For further information regarding Siemens Industrial Edge, please see

www.siemens.com/industrial-edge

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